

WHAT IS CLAIMED IS:

Sub 1

1. A method of manufacturing a nitride semiconductor substrate, comprising:

a first step of selectively forming an irregular region on the main surface of said base substrate;

a second step of growing a semiconductor layer of nitride on said irregular region in said base substrate so that a recessed portion in the irregular region is filled and the upper surface thereof is even; and

a third step of irradiating an interface between said semiconductor layer and said base substrate with a laser beam, thereby separating said semiconductor layer from said base substrate to form a semiconductor substrate from said semiconductor layer.

2. The method of manufacturing a nitride semiconductor substrate according to claim 1, wherein

in said third step, the laser beam is irradiated upon at least a raised portion in said irregular region.

3. The method of manufacturing a nitride semiconductor substrate according to claim 2, wherein

in said first step, a plurality of grooves extending parallel to each other are formed on said main surface of said base substrate, and

in said third step, the laser beam is irradiated while scanning along raised portions surrounded by said plurality of grooves in said base substrate.

4. The method of manufacturing a nitride semiconductor

substrate according to claim 3, wherein

said base substrate comprises sapphire whose main surface is in the {0001} plane orientation, and

the direction of the zone axis of each said groove is in the <1-100> direction in said base substrate.

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5. The method of manufacturing a nitride semiconductor substrate according to claim 2, wherein

in said first step, a plurality of island shaped raised portions are formed on the main surface of said base substrate, and

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in said third step, a pulsed laser beam is irradiated while scanning in synchronization with said plurality of raised portions in said base substrate .

6. The method of manufacturing a nitride semiconductor substrate according to claim 2, wherein

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in said third step, the laser beam is irradiated simultaneously upon the plurality of raised portions in said irregular region.

7. The method of manufacturing a nitride semiconductor substrate according to claim 1, wherein

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in said first step, the area occupied by the recessed portions is about in the range from about 1/5 to about 100 times the area occupied by the raised portions.

8. The method of manufacturing a nitride semiconductor substrate according to claim 1, wherein

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in said third step, the laser beam is irradiated from the surface opposite to the main surface of said base

Q21 substrate.

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